INTRODUCTORY ADDRESS.

Gentlemen,—Could we recall to earth one of those skin-clad savages, whose graphic remains are still visible in the caves on the shores of our neighbouring firth, whose kitchen-middens and lacustrine dwellings are yet traceable even nearer home, and who 2000 years and more ago got their precarious living by hunting the stag and the boar in those trackless forests which then occupied the hills whereon our fair city now rests, or by catching the fish or the wildfowl of those lochs which now, as beauteous gardens and fair meadows, surround and adorn our dwellings, we could hardly imagine the wonder and awe with which he would survey the changed scene.

But the awe-struck amazement of this ignorant savage at all the wondrous civilization of this nineteenth century, would be as nothing compared with the admiring astonishment with which Hippocrates—the father of our art—could we rouse him from his long slumber, would regard the present state of medicine. A denizen of Greece—in the palmy days of Pericles and Phidias—we must forgive the scornful smile with which he would glance at our paltry architectural imitations, specially at the unfinished counterfeit of that Parthenon which he remembers in all its virgin beauty. Drawing his pallium closer round him as a keen north-easter whistles past, we shall suppose him to find his way into our Infirmary, up the main staircase, and into one of the side-rooms, where he is courteously received by the attending physician and his clinical clerks, who, mindful of Mr Syme's first axiom—never to look surprised at anything—are politely blind to the scanty raiment of their stranger visitor. Warmed by the genial atmosphere around him, feeling himself, as it were, at home amid the sick and their surroundings, conscious of his own personal reputation and of the esteem in which his views and his words were held for many hundred years, the venerable gentleman essays to impart a little clinical instruction in return for the kindness with which he has been received. Attracted by the appearance of some fluid collected in glass jars which he thinks he recognises, he proceeds to descant upon the prognostics to be derived from the appearance of the urine. He points out that clouds in the urine are favourable in proportion to the lightness of their colour, but that, however light may be that colour, the prognosis becomes more unfavourable if the cloud should rise instead of fall, and absolutely unfavourable—a fatal sign—if it cause a general turbidity of the urine without any sediment; while a sediment, smooth, white, and consistent, indicates freedom from danger and a short illness; but if the urine be occasionally clear, the disease will be protracted. Yellow thin urine indicates an unconcocted disease, and a danger lest the patient may not be able to hold out till the disease become concocted; while a dark-coloured urine is always bad, and the darker the urine the worse the prognosis, especially if it be accompanied by a farinaceous sediment; and if bubbles settle on the urine, the kidneys are affected, and the complaint sure to be protracted.[1] Thus pleasantly discoursing on the results of his experience obtained in his own infirmary—the Asclepion of Cos—and delighted at the ease with which his clear and incisive, if somewhat dogmatic, sentences have flowed from lips silent for so many hundred years, Hippocrates glances complacently round upon his audience, and finds that, while he has been speaking, one of the young men has, by boiling some of the urine in a test-tube, obtained an opaque, milky-looking fluid, and another a copious brick-red deposit. A little aghast at these peculiar and unexpected results, he wisely says nothing; and when suddenly asked as to what he thinks of the comparative merits of picric and nitric acids as tests for albumen, he feigns a little deafness, but the look of helpless imbecility which begins to steal over his face is not lessened when another inquires whether he prefers Moore's, Trommer's, or Bœttcher's test for sugar in the urine, or whether he possesses any other less fallacious, and what he thinks of a milk diet as a curative agent. The words "milk diet" recall the fast-fading colour faintly to his cheek, and with one timid glance at the microscope, beneath which one of the clerks has a preparation, the nature of which he is anxious to know, poor Hippocrates passes out into the ward, discoursing pleasantly of the virtues of ass' and of cow's milk, of their hurtfulness in fevers, and of their curative virtues in gout and in phthisis.[2] The physician, ignoring his visitor's peculiar ideas as to the use of milk in fever, courteously inquires his views as to tubercle, what he thinks of its relation to inflammation generally, and to catarrhal pneumonia in particular; and, without waiting for his answer, shows him a fine specimen of the cracked-pot sound, and then hands him a stethoscope that he may listen to a peculiarly good example of bronchophony. The word has a Greek ring about it, and thinking he may understand it better with the instrument in his hand, Hippocrates takes it, and, uncertain what to do with it, looks first at it and then through it, considers whether he should listen to it as to the moaning of the sea in a shell, or whether the sound is to be produced by blowing through it as a trumpet, and, utterly bewildered by all he has heard and seen, suddenly recollects an important engagement in Thessaly,[1] and with many thanks returns the wonderful but unknown instrument, and departs a sadder if not a wiser man, fully conscious that if called upon to pass a clinical examination of to-day, he—the great clinicist of antiquity—would infallibly be found wanting.

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[1] *Vide* Προγνωστικον and 'Αφορισμοί.

[2] 'Αφορισμοί.

And yet it was by the hands of Hippocrates, and in the Asclepion at Cos, that the torch of medical science was first so trimmed as to give a steady and a brilliant light, and it is only by successive trimmings and fresh supplies of oil that it has attained the refulgence it now possesses. We—your teachers—have done and are still doing all in our power to brighten its light, and in handing that torch to you to transmit to succeeding generations, we do so in the sure hope that among you there are at least some few, and the more the better, who love and reverence truth for its own sake, and by whom medical science shall be yet more greatly advanced in grandeur and utility during all those ages yet to come, as "the great world spins for ever down the ringing grooves of change."

The first lesson that we learn from this little episode of Hippocrates is the very great advance in scientific accuracy which medicine has made since his days; and though that is evident enough even from the broad touches with which I have painted the scene, yet the reality is so much greater and grander, that time would fail me even to sketch cursorily the more prominent points, nor is it needful on the present occasion. The second lesson, and a most important one it is, is, that the most thorough knowledge of ancient medical lore and the most perfect acquaintance with the purest Ionic Greek is of no practical value to the medical student of the present day, and probably Greek has therefore been placed amongst the optional subjects of the preliminary examination by the Royal Colleges. We are not here to cavil at the course of study laid down for us, but reverently to obey it, and to show how and in what spirit it may be most profitably pursued, otherwise I might have been tempted to ask why Latin should be made compulsory and Greek only optional, and this all the more that the latter is still a living language, while the former has long since been dead. The truth is, however—and it is well to remember it—that there is only one language in the world of any great importance, and that is our own. It is the most widely diffused of any language in the world, and in it are published the results of the scientific labours of the two greatest nations on the globe, while its simple grammar and the almost equal combination of Teutonic and

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[1] With the worms, probably; that being his supposed burial-place.

Romaic elements of which it consists make it more easily acquired by most Europeans than any other. For these reasons, and because he believes that English will one day become the common scientific language of the world, the senior Professor of Zoology in the University of Upsala, Dr Thorell, has recently published in English his great work of 644 pages on the Synonyms of European spiders, not a very important work in our eyes, perhaps, but a most important work nevertheless, as showing that in Dr Thorell's opinion—and he is no mean judge—the largest circle of scientific readers is to be reached through the English language. This, therefore, is a strong inducement to us all to cultivate purity in our language, always preferring words of Teutonic to those of Romaic origin where there is any choice, not only because they are always more forcible, but also out of respect to our Teutonic cousins, who rank next to ourselves in number and importance; and to seek by accuracy in our grammar, and by expressing ourselves in a logical manner, to ensure that we not only understand ourselves, but can be understood of others. This is a matter which concerns our everyday usefulness: not a day passes in which we are not called upon to form an opinion as to the nature of a case, and to suggest a treatment; but we cannot do either the one or the other without reasoning consciously or unconsciously, correctly or incorrectly. Surely, therefore, I am justified in pleading for the study of logic, if not as part of your compulsory instruction, at least as a most necessary part of that education to which you ought all voluntarily to submit, that you may learn the nature and rules of evidence, and of the procedure of your own minds in the search after truth. Arithmetic, algebra, and geometry, which are all compulsory subjects of the preliminary examination in general education, owe that position mainly to the mental training they afford; but this is far inferior to that to be obtained from the study of logic, being of a much more elementary character.

But we are not quite done with Hippocrates yet; and the third and most important lesson which I would have you learn from him is what you ought to think of the profession you have adopted, and in what spirit you ought to pursue the studies which are to prepare you for its exercise. In his work *περι τεχνης*,[1] Hippocrates says, "What I understand by the science of medicine, is to deliver the sick completely from their sufferings, to mitigate the intensity of disease, and to undertake nothing for those overcome by their malady." With this latter sentence, however, no right-thinking physician can have any sympathy; to preserve, and, if possible, to prolong life, is the great object of the medical art; but every physician knows that hope is the best of all restoratives, while anxiety and fear act as deadly poisons, and that the life of a patient may be as effectually shortened by the words and manner of the physician as by any overt act on his part. We must never forget, then, that even the inevitable and recognised approach of

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[1] Of course I am aware that this work is believed not to have been written by the great Hippocrates, but as it undoubtedly emanates from the school of Cos, it no doubt conveys his views.

> "That Shadow cloaked from head to foot,
> Which keeps the keys of all the creeds,"

does not absolve us from the discharge of our final duty to our patient—to promote his euthanasia. Even in the stage of dying, the physician ought not to forsake the sick; even then he may become a benefactor, and, if he cannot save, may at least relieve departing life. But with this exception, we may accept the definition of medicine just given as correct. It is the art of relieving suffering and curing the sick, and all your studies ought to be carried out with this end ever in view.

Too many regard the examination for the diploma at the end of their studies as all that has to be prepared for; yet that may be passed, and the new-fledged licentiate be very ill prepared for the duties about to devolve on him. On the other hand, no one can diligently pursue his studies with the great object of the medical art ever before him, without finding himself at the end of his probationary period not only fitted for the exercise of that art, but also, and therefore, qualified to pass his examination. And keeping this end constantly in view, it is astonishing what a new charm is lent to every branch of study; how interesting and important even trifling matters appear, while the commonest objects seem invested and consecrated with a halo of science. Nor am I merely using sounding words without significance: take, for example, the optional subject of Natural Philosophy—which none of you should, however, omit attending a course of—and see with what interest the dry details of hydraulics, of mechanics, and of pneumatics, become invested, when we come to understand that the same great laws which regulate the movements of the solids and of the fluids around us are equally applicable to explain the movements of those of which we consist. This identity of those laws, by virtue of which we live and move with those which regulate external nature, opens up wide views of the cosmogony of which we are a part, the grandeur of which is not lessened when we reflect that the same laws which produce the soft breezy murmur of natural respiration also give rise to the howling of the wintry storm; and that the lightning's brilliant flash is but the vivid manifestation of a force which pervades all nature, and which is so ever present in every act evincing life, and so intimately connected with our own organism, that by many it has actually been supposed to be life itself, though indeed it can lay claim to no higher title than the *anima mundi*—if you will, the *anima hominis* is of a different stamp.

Again, if we take the subject of Natural History, which is recommended by the Colleges, and which I cannot see that you can well do without, and which includes both Botany and Zoology, though these are usually taught separately, a very cursory inquiry will show how important an influence some of the commonest objects are exercising, or may be made to exercise, on both medicine and science. Between Botany and Zoology there is a vast borderland occupied as some believe by spores or germs, some of which develop into fungi, which are indubitably plants, while others develop into Bacteria, which are at least apparently animals (and so they were regarded by Ehrenberg); while others look upon all these bodies—Fungi, Bacteria, etc.—as Protista, or members of a primordial kingdom, which develop under certain chemical agencies without pre-existing germs, and from which both plants and animals may originate by gradual modification of their simple organisms. In this borderland there is now being fought out the Battle of Life, as we understand these words, the great question of creation or development. By investigating this obscure corner of His kingdom, our finite minds are endeavouring to ascertain whether the Infinite Mind created individuals with power to propagate their kind, or merely matter organizable under certain conditions and in certain circumstances. Nor must we regard this question as one purely scientific, and of no practical value. In this city we need use no vague expressions, we can state exactly how much this question is worth to us, for the Managers of our Infirmary have deliberately stated that a belief in the panspermic hypothesis and in its congener, Pasteur's vital theory of fermentation, is worth six hundred pounds a year; a most extraordinary sum to stake upon a mere hypothesis, when we poor physicians are expected to provide microscopes and thermometers for ourselves, articles which are of truly practical value, and which would not cost a tithe of the money. In making this statement, I by no means wish to invalidate Mr Lister's great success in treatment,—that I have no desire to rate otherwise than as he himself puts it; but as it is evident that under almost any other theory similar results might be attained for a merely nominal sum, I am justified in stating that the panspermic hypothesis costs our poor Infirmary no less than six hundred pounds a year.[1] Moreover, the panspermic and development theories have reciprocally important bearings on the cure and on the prevention of those many troublesome diseases which depend upon the presence of microscopic plants upon or within the organism; and, passing thus into the more truly botanical field, we find that a great many of those important phenomena which we are accustomed complacently to term animal, can be most conveniently studied in members of the vegetable kingdom. For long, Botany was a mere collecting, naming, and classifying of plants; even yet it has scarcely got beyond the stage of organography; but a bright future awaits it when once it fairly gets into the domain of practical physiology. One of our number, Dr Pettigrew, has already sought to make his mark by connecting the phenomena of vegetable with those of animal circulation; but the field of inquiry is not restricted to one department, it is commensurate with the domain of life. An explanation of the cause of the movements of the Bacteria, the Desmidiæ, and of the Diatomaceæ, cannot fail to have an important influence in regard to our knowledge of the movements of animal life; while an investigation into the mode of production of the movements of the Mimosa, the Hedysarum, and the Dionæa, which seem to be of a different character, cannot but afford information as to the mode in which a stimulus is perceived, this perception constituting the essence of a nervous system. Even conscious intelligence seems to be possessed by plants. Under this head I scarcely rank those remarkable phenomena whereby the flowers we tread on in our daily walks seem to know much better than we do what-o'-clock it is, which way the wind blows, and what weather we may expect; because, however wonderful these phenomena may seem when thus put into words, they may all ultimately be referred to the perception of an external stimulus; and though that can hardly be regarded as a more purely material act than the perception of an internal stimulus, which volition essentially is, yet there are other phenomena existent in the vegetable world which seem less equivocally the result of the possession of conscious intelligence, and which cannot apparently be referred to anything else. Thus, if a rose-bush be planted with dry earth on one side and rich soil on the other, the roots at first start out all round as usual, but those that begin their journey through the poor dust speedily receive mysterious warning of the better land lying in the opposite direction, and they all turn back to follow their companions who have gone into the rich pasturage. Again, various examples are on record of trees which, growing in barren situations, as on the top of a wall, have thrown all their vigour into one rootlet, which was sent downwards to seek for better soil whereby it might be nourished; and in Silliman's *American Journal of Science* for 1840 we read of an elm which, growing on the top of a boulder, became accidentally detached on one side, so that its trunk lay parallel with the earth. As if conscious of its uncomfortable position, it sent out a branch from one of the most vigorous of the detached roots, which, taking a hitch round a projecting angle of rock, again united with the parent stalk, and this, thus supported, in a few years regained its vertical position, and when last seen was a tree fifty feet high and four and a half feet in circumference. But, indeed, though those instances seem conclusively to point to the possession by plants of what we cannot otherwise define than as a conscious intelligence, limited certainly in its external manifestations by the absence of organs and occasions, and possibly limited in its very essence, they are not more wonderful than the motions daily exhibited, by which the radicle constantly seeks the ground, while the plumula shoots into the air; or those by which some of the higher phanerogamous plants twist in spirals round objects near them, and by which all preserve one side of their leaves towards the light—motions which can neither be regarded as accidental or merely mechanical acts. While, as if to add to our wonder, we find that in quite recent times it has been shown that certain electrical phenomena, which accompany the contraction of muscle and the activity of nerves in animals, also occur in those parts of plants which exhibit similar functions; and Mr Darwin is said to have made observations which tend to prove that the leaves of the Dionæa not only catch flies but also digest them.[1] All these facts tend to connect the vegetable kingdom very closely indeed with the animal one, and to make the study of vegetable physiology a most important means of obtaining information; while from the many great and evident advantages it possesses over animal physiology in facility of research, it is very likely to spread the study of practical physiology over a much wider area, and may thus possibly hasten the attainment of important results.

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[1] The past history of surgery, coupled with the present attitude of scientists towards Pasteur's theory, fully justify this statement. I respect Mr Lister almost as much as I venerate Hippocrates; but in these days progress is more rapid, and though a friend of Plato, I am a greater friend of truth.

Thus you see what an intensity of scientific interest gathers round the careful observation of such very common objects as a little green mould, the leaf of a plant, or drop of putrid fluid.

Nor is it otherwise if we turn to the animal world. I shall give but one example. You are all aware of the great excitement produced in the scientific world by Darwin's announcement of his ideal law of development; yet one of the commonest objects about us is a frog, which begins its free existence with the organization of a fish, and, after undergoing a remarkable metamorphosis, attains the condition of an air-breathing quadruped, capable of easy and rapid terrestrial locomotion, and drowns in that fluid in which it formerly lived. Now, if there be any truth in the statement that all the various species of animals have arisen through ordinary generation, one from another, by a process of development, then the life-history of so singular an animal as the frog may with reason be expected to have some bearing upon such a process. About this very common object, therefore, are gathered biological questions which bear upon the origin of species, upon the course and mode of organic development, as well as upon other speculative problems to which answers are as yet far to seek.[2]

We see, then, that these optional subjects—Natural Philosophy and Natural History—contain not only a vast amount of most interesting information, without a competent knowledge of which no medical practitioner can have any pretension to call himself well informed, but also convey a great deal of instruction, without which it is impossible to recognise many diseases, and which has a most important influence both upon the treatment and upon the prevention of others. And the only reason, I conceive, why these subjects are not so popular or so universally studied as they well deserve to be, seems really because they are so utterly neglected during early life, when the mind is usually so open to material impressions, and so little able to reason or to understand even the simplest process of ratiocination. Yet this is the period selected for drumming into the youthful mind all the scholastic intricacies of grammar; while, if the natural sciences are taught at all, all their delights are veiled beneath dry systematic details, which are too often regarded as their needful foundation, instead of merely as an important culmination, which they really are. Yet the simple facts of natural science present details which are no less curious and attractive to the eye of childhood, than they are important to the philosopher in their bearing upon the general laws of nature; for a philosopher is but a child of larger growth and wider views.

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[1] *Vide* paper by Dr Burdon-Sanderson on the Electric Phenomena which accompany the Contraction of the Leaf of Venus's Fly-trap (*Dionæa muscipula*), read at the last meeting of the British Association for the Advancement of Science, September 1873.

[2] *Vide* paper on the Common Frog, by St George Mivart, in "Nature," for 2d October 1873.

But to turn now to the more purely professional part of your studies, I would have you remember that you must study each branch with diligent care, and with an eye not to future examinations—that makes it mere drudgery—but to its future usefulness as a means of aiding you in the cure and prevention of disease; and in this connexion it is astonishing how much interest centres round even the driest minutiæ. You must, therefore, in studying Anatomy, remember that you are not busy with an abstract science, but with the physical basis of medicine. In regard to surgical diagnosis, the external configuration of the body must be carefully conned, and compared with the bones, the joints, and the outlets of the skeleton, so that we may familiarize ourselves with the peculiar feeling of the normal state of all these parts through the integuments, and thus the more readily detect any deviation; while a knowledge of the position and insertion of the ligaments and muscles surrounding a joint may frequently afford us the greatest aid in reducing a dislocation and in determining the amount of injury the joint has received; at the same time that the origin and insertion of the muscles of a limb, and their consequent line of action, guide us to the right position to place that limb when fractured. It is self-evident, also, that a knowledge of the position of all the large arteries, in regard to certain fixed points, as well as their relations to their concomitant veins and neighbouring nerves, is of the very utmost importance, not only for the safe carrying out of any operative interference upon them, but occasionally even for the mere preservation of life in the case of sudden accidental hæmorrhage. In short, while to be a successful surgeon it is necessary to be an accomplished anatomist, the merest tyro may occasionally be the fortunate means of saving life merely by his anatomical knowledge and his presence of mind in applying it. Passing by, for the present, the many other important applications of anatomical proficiency to surgical practice, we may ask what possible connexion anatomy can have with medicine; here we have only symptoms to treat, not dislocations to reduce. But without a very competent knowledge of anatomy, how could we decide as to the origin of an abdominal tumour, and thus determine its treatment? how could we be led from subscapular pain to suspect the existence of liver disease? how could we know which is the base and which the apex of the heart, and thus clearly understand the course of the circulation, and the nature of its derangements? or how could we understand the direction in which the lungs would be compressed in pleuritic effusion, and thus determine the best position for tapping, or give a rational answer to one of the many similar problems which come daily before physicians, and upon a correct solution of which depends the diagnosis of the disease, and therefore always the relief and often the cure of the patient? Instead of being of less importance, a thorough knowledge of anatomy is of even more consequence to the physician than to the surgeon, though, because the actual source of medical ailments is not usually so obvious as that of surgical ones generally is, he requires to ally his anatomy with its sister science Physiology before he can track the lesion to its origin. For, as anatomy teaches us the structure of the body, so physiology teaches us the functions of each separate part of that structure; and as surgery occupies herself most with lesions of structure, so lesions of function come most frequently under the care of medicine; while effectually to relieve, and certainly to cure, or even to give a reliable prognosis, it is necessary that we be able to trace the lesion of function to its anatomical source. How otherwise could we, with any hope of success, propose to treat obstinate neuralgia of the shoulder-joint or amaurotic blindness by a similar procedure—the extraction of a carious tooth? yet in each instance this has been done. A thorough knowledge of the functions of the various parts of the cerebro-spinal system, and of the anatomical direction of their fibres, enables us nowadays readily to separate one from the other many diseases of the nervous system which were formerly slumped together, to assign them their local habitation, to give in each case a tolerably definite prognosis, and, as you can readily understand, to treat them with a much greater prospect of success. To do this profitably, however, we have first to apply for needful information to Pathological or Morbid Anatomy; and confining our attention at present to the spinal cord, we find that morbid anatomy teaches us that one predominant lesion of function—paralysis—may be associated with two very different conditions of the cord; in the one case we have an excess of blood and a congested condition of the bloodvessels, while in the other we have the very reverse—a pale exsanguined condition of the parts affected. Both may occasionally go on to softening, but in each case this softening presents a different appearance, and depends upon a different cause; and while morbid anatomy exhibits the parts and describes their appearance, it is from Pathology itself that we obtain a rational and connected history of the various modes of causation of these lesions and of their possible terminations. From Systematic Medicine we get a succinct history of the various symptoms common to those two forms of lesion as well as of those in which they differ, and which constitute their differential diagnosis; and from it we also acquire a knowledge of the various methods which have been adopted to cure that disease or disordered manifestation of life depending upon each peculiar lesion, or to relieve the sufferings which result from its interference with the normal discharge of function. While Clinical Medicine exhibits to us an actual example of the disease in question, points out the various symptoms and signs by which it may be recognised and differentiated from other diseases, passes in cursory review the various methods of treatment which have been propounded, and finally selects that which, for reasons given, seems most appropriate, and proceeds to apply it. But the selection of the remedy proceeds not on any merely haphazard fashion, but upon information already received from the teachings of what we term Materia Medica and Therapeutics, which instruct us in a two-fold fashion—first by pointing out what have been the results already obtained by the employment of certain remedies in certain diseases; and, second, by showing what are the actual physiological effects of certain remedies, and then suggesting their employment in those diseases in which the production of these effects seems desirable. For instance, in reference to the two forms of disease of the spinal cord, both productive of paralysis, we are taught that our forefathers employed various remedies in such cases with very various results, and without any very definite idea as to what they were doing, except that they were employing in a case of paralysis, whose cause was unknown, a remedy which some one had found useful in another case of paralysis whose cause was also unknown, the mode of action of the remedy being even less known. Of course it would have been contrary to reason to expect that remedies so applied could have been successful except in the most accidental manner; the consequence was that no certainty was felt, and so-called remedies were apt to be changed with the same thoughtless rapidity as a kaleidoscopic pattern. Now the case is quite different. I have already told you that we know that paralysis may depend upon two different conditions of the cord, which we are able to recognise; but we also know from the researches of modern science that there are two sets of remedies, with distinct actions, one of which increases while the other diminishes the amount of blood in the cord; and by the judicious application of the appropriate remedy to the proper case, we are able to attain with comparative certainty results which our forefathers could not aspire to.

All the interests of professional life centre round the relief of suffering and cure of disease—that is, round practical medicine and practical surgery also, of course; all that I have said referring equally to surgery, only the illustrations would require to be changed; and yet we see how the successful practice of medicine is dependent upon a thorough knowledge of Materia Medica, Pathology, Physiology, and Anatomy, how impossible it would be to diagnose, to prognose, or to treat disease properly without an accurate acquaintance with these subjects. You will remember how, in times long past, the Dogmatists proclaimed the necessity of founding medical practice upon such a knowledge of those sciences as was then to be obtained; while the Empirics decried them all, and boldly asserted that experience was all that was requisite to make a man a physician or a surgeon. But time has changed all that, and by substituting precision in our information in regard to these matters for mere vague guesses, has at once widened the basis of our experience and made it more accurate, so that the enlightened empiricism of our day rests securely on the broad foundation which the Dogmatists commenced to lay; and we have relegated to an earlier stage, and to more truly preliminary studies, the statement of the moderate and Methodic Celsus, that, though these things do not make a man a physician, they at least fit and prepare him for becoming one.[1]

You will observe that I have omitted all notice of those ordinary subjects of professional education, Chemistry, Midwifery, and Medical Jurisprudence; but two of these are as much outcrops of general medical study as medicine and surgery themselves, while the third stands a good deal by itself. A former distinguished lecturer in this school stated that upon one occasion, while teaching his students the properties of copper, he was interrupted by a very clever physician demanding why he thus wasted the time of his pupils when he ought rather to be teaching them to analyze tubercle. "And yet," added the chemist, "had my demonstration been on the very matter this doctor demanded, I must have begun with teaching that tubercle could not be analyzed without the use of the oxide of copper."[2] I myself would go a step further, and say that I do not see that we have any business to waste our time analyzing tubercle at all; we must leave that to the chemists. Chemistry, and especially organic chemistry, is so vast a subject, and requires in any experimental investigation so much accuracy in details, and so complete a knowledge of possible fallacies, and of their source and mode of correction, that it is utterly hopeless for any one but a professed chemist to carry them out successfully. Without a moderate knowledge of chemistry, however, it is impossible to understand the aeration of the blood, the digestion of the food, etc., or to detect various morbid products, such as sugar or albumen in the urine, therefore chemistry is very properly included among the subjects of professional education; but we must never forget that all we get is a mere—though a very necessary—smattering, and that on all important occasions we must apply to a professed chemist, while medicine will assuredly halt until we have a practical chemist attached to all our large infirmaries. Midwifery, however, is as independent an art as medicine or surgery, and rests like them upon the same foundation of natural science—the most ordinary case is a most interesting problem, involving a thorough knowledge of anatomy, physiology, and mechanics; while, if the slightest halt take place, the materia medica may require to be called upon, or it may even be a question whether surgical interference may not be required; we cannot therefore practise midwifery successfully without a perfect acquaintance with all the ordinary branches of medical study. The subject of Medical Jurisprudence is in precisely the same position; it is based upon a thorough knowledge of every department of medicine, and to this must be added a knowledge of forensic procedure which is best obtained by practical instruction, for which there is ample opportunity in this School. Besides this, the recent Public Health Act, which enacts the appointment of medical officers of health by every urban and rural sanitary authority throughout England and Wales, must of necessity elevate into still greater importance, if this be possible, all the subordinate branches of medical study; for the practitioner holding such an appointment will very soon be taught that he has no longer to deal with a blindly credulous public, but with men trained to detect sophistries, who will not accept a smattering of law as an excuse for an absence of precision in medical knowledge.

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[1] Milligan's "Celsus." Edinburgh, 1826. Liber primus, p. 11.

[2] *Vide* Dr George Wilson's Introductory Address, "Edinburgh Medical Journal," 1850, p. 561.

There are also many special studies, such as Ophthalmic and Aural Surgery, and Medical Psychology, all of the greatest importance for the well-being of mankind, but all merely outcomes—finials, as it were, of the great structure of general medical education. I strongly recommend them all to your careful attention, for without some knowledge of them no medical man can regard himself as thoroughly qualified, as, even though not specially qualified himself, he must frequently be called upon to decide whether a specialist should be called in or not.

In all your studies, however, I must recommend you to remember well the old saying, *Non multa, sed multum*, you must not divide your attention over too many subjects at once, otherwise you will speedily lose heart at the vastness of the field of study, but must master one before you proceed to another. Sidney Smith used to say that there was nothing like taking "short views" for enabling one to get through life comfortably; and the same thing is true of medical study. If you really could, however vaguely, realize the amount of information you will be required to obtain during the next four years, most minds would, I think, shrink appalled from the task; and yet, thanks to short views and one step at a time, if you are conscientious in making your foothold secure before attempting to advance, you will all in due time reach your desired goal. But in everything you must remember *Non multa, sed multum*, a rapid transition from subject to subject is apt to impair the faculty of sustained attention, and to induce a superficial, uninquiring, and far from independent habit of mind. You must ever remember that experience, which it is all our desire to obtain, is not the result of observation merely, but of reflection. A most distinguished clinical author of last century says, "There are only fifteen beds in the public hospital of this place, and I do not wish for more. . . . It is not eating alone, but digestion, that gives strength. A physician who tells us that he visits a hundred and fifty, or even a greater number, of sick people daily, has, in my opinion, so little pretensions to the title of an experienced practitioner, that I would even deny he had any experience at all. For nature is not so complaisant that she will unveil herself at once to whoever casts eyes on her."[1] You must, from the very first, frequent the Infirmary, and accustom yourself to the sight of disease and suffering, without at first attempting to understand what it is all about. Much that you thus see, without comprehending, will hereafter recur to your memory and find its fitting explanation; and knowledge thus obtained is never forgotten, and you will, day by day, pick up information which will open up the ultimate intentions of your studies and render even their driest detail a matter of interest. And even as you feel yourselves to advance necessarily step by step, a knowledge of medical history will teach you that medicine itself has so advanced, and is still advancing. Day by day the fundamental sciences upon which our art is based are giving us newer and more accurate information as to our functions, their mode of operation, and reciprocal action one upon the other; while, day by day also, the wonderful science of chemistry is giving us new weapons wherewith we may combat disease and death. We are always moving onwards, the medicine of to-day is not that of yesterday, and to-morrow will find us still further advanced. I would that time would permit me to recount the great progress that medicine has made in the short period that has elapsed since I myself sat a tyro on these benches: alas! a day would not suffice to make that progress intelligible in all its relations to the past, and all its bright hopes for the future. But a cursory reference to a single disease may suffice to indicate my meaning. I shall take as an illustration the treatment of delirium tremens. Forty years ago delirium tremens was regarded as caused by a violent excitement of the cerebrum, which had to be reduced by the most powerful sedatives to prevent death, the axiom being that the patient must sleep or die. Under the influence of this idea, so long as blood-letting was regarded as the great sedative, it was used freely in all such cases. By-and-by, as the importance of sleep and

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"Medical and Surgical Observations." By A. G. Richter, M.D. Translated from the German. Edinburgh, 1794. Preface, p. 15.

the danger of bleeding became recognised, very full doses of opium were employed, which were scarcely less dangerous than the bleedings they were employed to replace.[1] Shortly after this an American physician, Dr Ware, pointed out that delirium tremens was a disease which had a tendency to terminate naturally in sleep at the end of sixty or seventy hours, provided only the strength was supported by nutriment;[2] and this was followed by the free use of padded cells, in which the patients, though preserved from the risks of physic, were exposed to various other risks from constitutional exhaustion and exposure to cold, etc.; and with this phase of treatment was associated the dogmatic enunciation that "the doctrine of the definite course and duration of delirium tremens ought to make us slow to entertain any extravagant expectation of materially abbreviating its duration by therapeutic measures."[3] While another authority declared that "food is *the* stimulus, *par excellence*, for the brain which frequent narcotism has reduced to the state in which delirium occurs, ... in all these cases the action of food may be supplemented or partially replaced by stimulant doses of alcohol, ammonia, etc., but *true narcotics are injurious*."[4] Unfortunately for the truth of both of these statements, chemistry just at that time supplied us with *a true narcotic* (hydrate of chloral) which not only does no harm, but which actually cuts short within twelve hours what it took nature from sixty to seventy to accomplish. From all this we learn that most important lesson, that our power to cut short disease is limited, not so much by the processes involved, as by our ignorance of the means to be employed, and that a brighter future for therapeutics may be looked for, once we have shaken ourselves free from the idea that the processes of nature cannot be successfully interfered with by art.

And now, Gentlemen, time warns me that I must conclude. You are just entering on your preparation for "the most sublime vocation of man; for next after the service of the Deity, and, indeed, scarcely second even to that, is to be a priest of the holy vital flame, and an administrator of God's highest gifts, and of the most secret powers of nature—in one word, *a physician*. And you must ever remember that when you at length appear before the throne of Eternal Truth you will be asked this question: I made you steward of the wonderful powers which I have placed in nature and her products to benefit mankind; how did you distribute those treasures? for the benefit of mankind, with gratitude and adoration? or for the honour of your own name, with selfishness and egotism? Did you, in your researches and actions, strive merely for truth, to help your brethren, or was it all for self-interest? To him to whom medicine becomes not a religion, it is the most disconsolate, troublesome, and ungrateful art on earth; yea, it must become with him the greatest frivolity and sin: for only that which is done in God, is holy and beatifying."[1] Let us, therefore, always remember that *laborare est orare*, that we can only show our faith by our works, and let us strive so that we may, each of us, apply to ourselves and to our daily lives, those noble words spoken by Dr Holmes, with allegorical reference to the structure of the Chambered Nautilus:—

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[1] Dr Gairdner's "Clinical Medicine." Edinburgh, 1862. P. 262.

[2] "Transactions of the Massachusetts Medical Society," 1831.

[3] Paper by Dr Cuming of Belfast in the "Dublin Quarterly Journal of Medical Science," for February, 1870, p. 74.

[4] Anstie "On Stimulants and Narcotics." London, 1864. P. 139.

> "Build thee more stately mansions, O my Soul,
> As the swift seasons roll!
> Leave thy low vaulted past;
> Let each new temple, nobler than the last,
> Build thee to heaven with a dome more vast,
> Till thou at length art free,
> Leaving thine outgrown shell by life's unresting sea."

And now I have briefly to refer to the changes which have taken place in the teachers of this School. Since we last met here Dr Arthur Gamgee has received the reward of his great abilities and scientific acquirements, by being appointed Professor of Practical Physiology in the Owen's School of Medicine, Manchester. This, I am glad to say, has been our only loss, if loss we can call it; for, though it has been a great gain to Manchester, it can scarcely be called a loss to us, since it has been the means of bringing amongst us a man like Dr Pettigrew, whose researches into the anatomy of the heart, the mechanics of flight and of animal movement generally, and the physiology of the circulation, have already gained for him a European name, which will no doubt be increased by the lectures on Physiology which he now commences. Dr Grainger Stewart, who is well known to you all, commences this year a course of Systematic Medicine. And we have, on the most important subject of Insanity and Psychological Medicine, two new names to enrol—Dr Clouston, the successor in Morningside Asylum of our old and much-esteemed friend Dr Skae, whose inquiries have extended mainly in the direction of the therapeutics of insanity; and Dr Batty Tuke, whose name is well known as a most able investigator into the physical causes of insanity; both of these gentlemen we welcome as most important accessions, and I trust they may both receive an encouragement proportionate to their deserts.

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[1] Hufeland's "Enchiridion Medicum."

PRINTED BY OLIVER AND BOYD, EDINBURGH.